

# gRPC and Protobuf(Proto)

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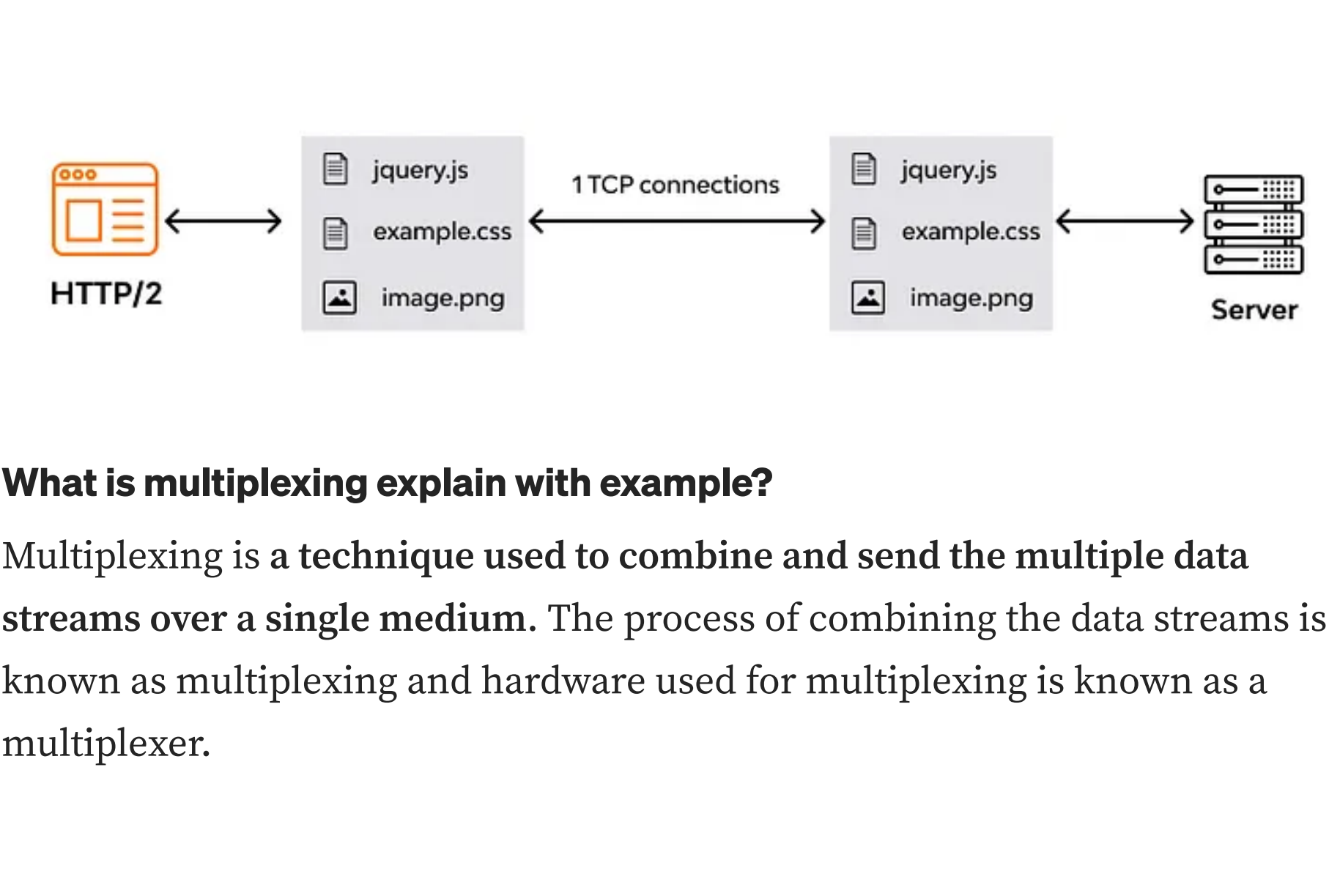
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## What is the gRPC?

A general RPC (Remote Procedure Call) framework over HTTP/2, initially developed at Google. gRPC is a language neutral and platform neutral framework that allows users to write applications where independent services can work with each other as if they were native. It uses Protocol Buffers as the interface description language.

HTTP2 is much faster and more reliable than HTTP1. HTTP1 loads a single request for every TCP connection, while HTTP2 avoids network delay by using multiplexing. HTTP is a network delay sensitive protocol in the sense that if there is less network delay, then the page loads faster.



## What is multiplexing explain with example?

Multiplexing is a technique used to combine and send the multiple data streams over a single medium. The process of combining the data streams is known as multiplexing and hardware used for multiplexing is known as a multiplexer.



These are the high-level differences between HTTP1 and HTTP2:

- HTTP2 is binary, instead of textual
- HTTP2 is fully multiplexed, instead of ordered and blocking
- HTTP2 can, therefore, use one connection for parallelism
- HTP2 uses header compression to reduce overhead
- HTTP2 allows servers to “push” responses proactively into client caches

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## gRPC

- Uses protobuf (v3)
- Again from Google
- Framework for RPC calls
- Makes use of HTTP/2 as well
- Synchronous and asynchronous communication possible

## Protobuf (aka protocol buffers)

- Open source cross platform data format used to serialize structured data.
- Binary protocol for data interchange
- Designed by Google
- Uses generated “Struct” like description at client and server to un-/marshall message

gRPC and Protobuf are 2 completely different things. Let me simplify:

- gRPC manages the way a client and a server can interact (just like a web client/server with a REST API)
- protobuf is just a serialization/deserialization tool (just like JSON)

## Protobuf or Proto:

Google protobuf or proto is just a mechanism for serializing structured data. Proto is smaller, simpler, faster and language neutral. You can see this similar to JSON or XML but its smaller and faster compared to it.

	XML	JSON	Proto
Human Readable Data	Yes	Yes	No
Browser consumable	Yes	Yes	No
JS Support	Yes	Yes	No
Data Security	Can be eavesdropped and decoded	Can be eavesdropped and decoded	Hard to robustly decode without knowing the schema
Processing Speed	< JSON	< Proto	> JSON, XML
Cost	Highly expensive when there are massive data	Highly expensive when there are massive data	Less expensive
Interfaces For RPC	No	No	Yes
Validations	Hand parsing and Validations are required	Hand parsing and Validations are required	Validations are easy with Keywords

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